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ABSTRACT

Perspectives on facilitating the use of quantitative tools in higher education decision-making are offered. Suggestions are directed to those in the institution who will be working with decision-makers, with a focus on how such individuals can assist the decision-maker in the development and use of computer-based tools. The instigators of computer tools must work through issues involving how useful quantitative information is to daily management decision-making. It is also important to understand and work with the political dynamics of higher education decision-making. Research on institutions using computer-based planning models suggests that this type of tool involves time and effort by the decision-maker to understand the benefits of such work. The users of computer-generated information need to be educated in the form that quantitative information is kept and how it can be accessed. Recommendations for the successful implementation of decision support tools are as follows: identify and develop the integrators in the institution, invest resources in training middle and senior managers, examine ways quantitative information is reported, and study the decision-making process and the use of quantitative information in it. (SW)

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The Use Of Quantitative Information In Higher Education Decision Making

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In recent years higher education decision makers have been bombarded with a barrage of decision support tools. Fourth generation data management systems are now becoming available which allow those without computing expertise easy access to computer-based information. Microcomputers are making their way into many offices for smaller computing tasks and for help in achieving computer literacy. Further, computer-based modeling systems have become an integrated part of the budget and mid-range planning cycle at many institutions.

Yet each of these decision support tools has a major limitation for each is based in the quantitative dimension and is often insensitive to major factors which play an important part in institutional decision making. Issues such as the mission of the institution, program quality, as well as the political dynamics both inside and outside the institution play a major role in decision making, yet are not easily (if at all) quantifiable. How then does the institutional decision maker make decisions using the state of the art tools in the computer and information technology without neglecting the nonquantitative realities of the day?

This paper seeks to begin to address the above question in a practical manner. Research on institutions using computer-based planning models as well as observations of an institution presently working toward the use of information technology serve as the basis for a number of observations on facilitating the use of quantitative tools in higher education decision making. Suggestions are directed to those in the institution who will be working with decision makers, and focus on how such individuals can assist the decision maker in the development and usage of computer-based tools. The paper then shifts to a recommendations section where several keys to successful implementation of decision support tools are shared.

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Introduction

One of the things I look forward to each academic year is the opportunity to attend a national conference on the use of computer technology in higher education admininstration. Like many of you I am excited about the tools presently available in the areas of computer hardware and software, teleconferencing, networking, video disks, etc. Without a doubt, these tools are having a profound impact upon society and, hence, upon higher education. The ability for a middle or senior manager at a college or university to have almost immediate access to information on students, finances or donors through the use of a "friendly" data management tool, as well as the ability to then take those data and work with them further to produce a final report (perhaps with computer graphics) which can be incorporated into a word processing document and electronically mailed to several individuals in the university will, I'm sure, dramatically alter the way we do business in higher education administration in the next few years.

Indeed, it is exciting to be among colleagues who are exploring the use of all this new technology in higher education administration. That is until, in a reflective moment, I consider the decision makers who supposedly are to be the recipients of all this wonderful technology. Unlike us, many decision makers are not that excited about the advances being made in the information technology field. Their feelings are perhaps more in the area of indifference, skepticism, or down right hostility. As one who has been given the charge to facilitate and promote the use of computer-based information by decision makers, these attitudes, of course concern me. I have thus spent a fair amount of time these past few years trying to better understand the basis for the attitudes that these decision makers have. What I would like to share with you this afternoon are a few of the observations that I have in this area in the hope that they may prove helpful to you as you deal with many of these issues.

Issues

1. To what degree is quantitative information useful in decision making?

When some of the early computer-assisted tools were first used in higher education a decade or so ago, some argued that their usefulness would be severely limited. Major decisions in higher education, many said, were made of the stuff that could not be placed into computers. Institutional mission (often with multiplicity and conflict of goals), academic quality, human interaction, and bargaining were vital aspects of the decision-making formula, all of which would be better left to the human mind which would be able to deal with such information better than a cold and inhuman computer. Many have voiced objections to a growing dependence upon computer programs to deal with the complex issues of the higher education decision maker. In my own research in the use of computer-based planning models by higher education decision makers, I have found that the inability of computer-based tools to deal with qualitative issues, as well as the questionable nature of

some data in certain areas of decision-making, often negates the value of such tools with decision makers in general.1

What perhaps disturbs me the most about these arguments against the use of computer-based decision support tools is that, in many respects, I believe that the critics are right. As John Thelin points out in his book Higher Education and Its Useful Past, institutions of higher education were making key decisions concerning curriculum, building plans, or future developments long before computers were present in administrative offices.2 What is shocking to those of us in the new information age, these naive and computer illiterate decision makers actually made some pretty good decisions! If we seriously believe that computer-based tools have a valid place in higher education decision making, we need to come to grips with the issue of what place such instruments have in the decision-making process. For one reason or another we have not addressed that issue to the extent that it is needed. We have become infatuated with the whirs and buzzes of the new information technology, we count the things that are easy to count, measure the things that are easy to measure, but fail to seriously ask the hard questions as to what usefulness such technology has to the senior decision maker who must deal with issues not easily placed on our wonderful computers.

One of the first issues we must deal with in this area is the appropriateness of using quantitative information in various administrative decisions. Whether they like it or not, higher education decision makers do live in a quantitative world where numbers related to students, tuition charges, salaries and building costs do matter. As much as we would like to imagine that higher education decision making is very different from that of the business world, we are, like them, very much restricted to the limited resources available, much of which can be quantitified. Quantitative computer-based tools can help the decision maker deal with the most current information available in making a choice as to the best path to travel in a particular policy area. We who deal with decision makers must, however, realize that in some decisions computer-based quantitative information may only present part of the whole picture that the decision maker has to consider in reaching a final decision. We must be committed to helping the decision maker weigh the value of such quantitative data in light of other, perhaps more important, information available. We must also realize that there may well be some decisions where our quantitative information, no matter how current, accurate, or impressive, is not appropriate for the particular decision at hand. In such cases we must be able to put aside the charts and numbers lest we compromise the value of computer-based tools in general in the eyes of the decision maker. What is perhaps most important in this area is the realization that decision support tools are intended for the support of decision making, not a replacement of the decision-making process. We must always be promoters of decision makers utilizing the best quantitative information in the decision-making process, and at the same time realize that this information must be used in tandem with other information available to the decision maker at the time.

2. Use of quantitative information in the management process.

Another important area which needs to be addressed is how computer-based tools can be used on a day to day basis to help the managers better administer their particular areas of the university. It would seem to me that the majority of energy that has been spent on information technology in recent years has gone into developing tools, with very little effort spent in helping managers work through the use of such tools in their jobs. Even in applications where quantitative information is necessary, there are many managers who simply do not know how to use the new information technology. In our quest to help managers deal with this issue, we must be prepared to do more than just plug in the terminal and show the manager how to work the keys. We must be prepared to address the organizational issues which will arise as computer systems make some jobs obsolete, change the skills necessary to work in other positions, and perhaps drastically change the way some offices have done business for several years. The facilitator of decision support tools must be equipped to deal with personal issues which may arise as a result of major changes in specific offices or throughout the university.

The promoter of decision support tools must also be ready to deal with managers in some areas of the college or university who have other concerns to deal with relevant to computers being used in their divisions. It has been stated many times that current and accurate information is perhaps the chief benefit of computer-based systems. It does not take long to realize, however, that to some people current and accurate information is a threat. There are no doubt some managers who are very concerned about their own ability to manage and are afraid that the use of analytical tools will show them to be poor managers, or at the least, managers who are not able to cope with the productivity tools of the future. It is easy to say that managers of the future (or the ones who make it to the future) will be those who are able to adapt and learn how to survive in the technological jungle. However, as the instigators of computer tools, I believe it is our responsibility to do everything we can to help the current manager (as computer illiterate as he or she may be) to both understand and be able to actively use these new tools in their daily business. This task will be somewhat difficult to do if we have not worked through the issues in this area in regard to our own management of resources. We must become role models of managers who are able to use quantitative instruments in decision making, as well as promoters and educators of such tools being used by others. To do this we must work through many of the issues involving how useful such information is to us in our own area in terms of day to day decision making. Only then will we begin to appreciate the struggles that other managers have in implementing decision support tools in their own offices.

3. How does using quantitative information affect the political process?

One of the more interesting aspects of the study of using quantitative information in higher education decision making is the interaction that

often takes place with the political dynamics at a particular institution. Most observers of higher education decision making place a lot of value on the political dynamics at work in most institutions in decisions that have an impact upon the university. Decision makers must deal with other decision makers either individually or in a group setting to determine the course of a particular program or project. Obviously the multifaceted goals and objectives of the college or university, which are often in conflict, also come into play when such programs or projects compete with each other for limited resources. The decision maker who is at a disadvantage in such a discussion perhaps because he does not have the most current and relevant data, is at a political disadvantage in general. If information is power, then the decision maker of the future who is able to use computer-based tools to supply himself with the latest information will have the "goods" on someone who does not have access to, and the ability to use, such information. Again, if we are to promote the use of computer-based tools we need to deal with issues of availability and access to information by all decision makers, as well as to the dynamics of personal and group interaction in the decision-making process. If we value computer-based tools, and are going to promote the use of quantitative tools in general in higher education, we had better be prepared to understand and work with the political dynamics of higher education decision making.

4. The use of new types of management tools by decision makers.

The kinds of issues that I have spoken of thus far could be present with any decision maker trying to make use of a computer-based tool, whether that be an electronic spread sheet similar to what he used to do by hand, or a data base managment system following a principle similar to what he used to have in a 3x5 box of cards on his desk. Many decision makers will have problems using computer-based tools just because they exist on a computer, and because additional training and perhaps overcoming uneasiness will be needed. However, many of these applications will be familiar enough to the decision maker so that once the computer uneasiness is overcome the tools will become useful. Quite another situation exists for those who attempt to implement computer-based tools which demand a different form of thinking by the decision maker. One such tool is the computer-based planning model that allows the decision maker to examine the effects of present decisions in terms of long range financial or other resource management. Unlike the tools where the logic is familiar to the decision maker, the world of computer modeling is often strange and thus involves time and effort by the decision maker to understand the benefits of such work.

In my own study of modeling and its usefulness in over one-hundred and thirty institutions, I found that for this decision support tool (or really any other) to be helpful to the decision maker an attitute of openness had to be present. Decision makers who have problems working with the new technology are often those who because of habit, ease of access, or just plain laziness, would rather depend on the old sources of information in a traditional form. They tend to do this even if the old sources of information are incorrect or out of date. Decision makers, like all of us, are after all creatures of habit.

The decision makers who will make use of the tools of the future will be those who are able to break the old habits and begin to think creatively about how to address the issues of the day. This may well mean that such previously unused instruments like computer models or statistical analysis might be used, not to replace the decision-making process, but rather as a tool for the decision maker to use in that process. In my study I found that those who were successful in modeling did not differ in educational emphasis or level, background in higher education, or even job classification, from those who failed in such efforts. They did, however, possess a desire to address the issues of the day in a new way and had an openness to approach problems from a new angle.

For those of us who have the task of facilitating such an attitude of openness in our institutions, there seems no easy answer if this attitude doesn't already exist. Certainly patience and sensitivity to the decision makers' viewpoints helps. (A severe financial crisis that reveals the danger of working with wrong or outdated data helps even more!) Like any good change agent, we must realize that any change will be gradual and no doubt occur over many months or years. Thus we must identify opportunities for the progress, whether that be with an individual who is open to the new technology, or a specific event (e.g. a budget planning meeting) where a specific step could be taken. Look for specific opportunities for change (not just the "blue sky" picture of what you would like to see ten years out) and make the most of opportunities for change that you see.

5. Strengthening the Suppliers of Information.

It is true in my institution, like perhaps many of yours, that there are several senior decision makers who are (or will be) using the new tools in their work through first-hand use. It is also true (especially in the next few years) that some senior decision makers will have to rely on others for the information gained from the new technology instruments. For these decision makers we must address the issue of using the new technology second hand (i.e. through another decision maker, a subordinate, or perhaps through an office of Institutional Research). It is perhaps a mistake to believe that because a decision maker does not have a terminal on his or her desk that they do not need training in the new information technology. Again, in my own setting, I find that the users of computer-generated information need to be educated in the form such quantitative information is kept and how it can be accessed. The decision maker can then request the information he or she needs (knowing it is available and it can be reported in such a fashion) in keeping with the need for information rather than the "availability" of information. Decision makers who can "call the shots" as to what information is acquired (and in what form) for a particular decision don't feel as uneasy about using such information in decision making. When they have no control over how information is reported, however, they tend to resist right from the start.

A major element in the use of computer-generated quantitative information for the decision maker without direct access (or perhaps who choses to be supplied) is the skill and ability of a intermediary party. This person must be someone who is intimately acquainted with the data, the way the particular system can work and report on data, as well as the way a

decision maker wishes the data to be presented. Such individuals have at times been labeled "integrators" and their work has proven to be a key element to the success of decision support tools at many institutions. Andrew Masland at Pennsylvania State University found this to be especially true in working with computer modeling applications.3 Having someone in a "decision consultant role", as Masland states, is important in formulating and analyzing the problem and in synthesizing a solution. Such an individual is obviously more valuable if they are resident at the university. The best situation would, of course, be for each decision maker to have his own decision consultant. However, such individuals are hard to come by and don't exist in sufficient supply for this to be possible.

Recommendations:

Although there has already been a fair bit of advice given in my comments, let me close by offering you a few specific recommendations which may be of help. These recommendations are directed to those who wish to promote the use of computer tools and quantitative information, whatever office of the institution they work in.

1. Identify and develop the integrators in your institution.

I am convinced that integrators, the individuals of whom I have just spoken, are so critical to the success of using quantitative instruments in decision making that I strongly suggest that you identify (or create) such individuals and do everything you can to develop their technical and managerial skills. In looking for such individuals, give preference to those with personal relations skills (the technical information can be learned) and to those who have a healthy respect for the complexity of the decision-making process as well as an appreciation for the nonquantitative measurements. If you find such an individual, get the most out of them while you can. They are no doubt on their way up the career path and may not be available for long.

2. Invest resources in training middle and senior managers.

It is all too common for us to spend large amounts of money on hardware and in developing software at our institutions with very little effort expended in developing the human resources that will use the information which is produced. We need to drastically alter our actions in this area. Education of the users of decision support tools is the critical ingredient which, although takes the most time to develop, costs the least. And this education needs to be on the part of decision makers as well as ourselves: they must learn the new technology, we must learn their needs, and together we must explore the potential applications of computer technology which address user needs. Part of this educational process will involve a serious dialogue with decision makers which will include a great deal of listening on our part. Listening to the questions, concerns, and perhaps even fears that decision makers have. We will have to begin to address the issues of the day not with fast and easy answers, but with a

well thought out response which shows respect for the concerns that have been voiced. It is only through this open and honest exchange that an integrity can be associated with our work. And it is only after this integrity is developed that our function as change agents can fully utilized.

3. Examine the ways quantitative information is reported.

We have all heard of the ways information can be obtained and manipulated using various decision support tools. It is unfortunate that at the same time we hear relatively nothing about how such information is most effictively presented to decision makers. How does one best summarize a great deal of information for senior decision makers so that only the essence of the data is presented? How can charts and graphs best be used to show summary information or relationships? How does one use various media or educational techniques in presenting information to decision makers in a group meeting? How can "live" on-line demonstrations be used in the decision-making process? These questions are fundamental to the use of the new technology in higher education. We all need to begin to address the answers to these questions and to share our findings with one another.

4. Study the decision making process and the use of quantitative information in it.

I have already stated that the subject of how quantitative information is used in decision-making needs to be addressed. That is true for higher education in general. However, each of us needs to address that subject for our own institution. We must know the decision makers at our own institutions and their perspectives with regard to the use of quantitative information and its usefulness (or potential usefulness) in their area. In many respects we must know better than the decision maker the data that are kept on students, faculty, or material resources, and how they can be reported and used in various decision-making activities. In a very real sense we must go far past this understanding and become students of the governance and decision making process in higher education. We must be able to see things from the senior decision makers viewpoint, with multiplicity and confict of institutional goals and objectives, with limited resources with which to work with, trends to follow, and awareness of projections for the future. Ray Bacchetti of Stanford was right when he stated that very little is known about how decisions are made in colleges and universities, and even less is known about how they should be made.4 Realizing that we are all rather ignorant about this subject, I would like to suggest that we take whatever steps we can to become educated. That might well include attention to written material on the governance of higher education, or attendance at a conference or workshop that deals with the subject. That might also include spending more time with the people who will be using the tools that we develop, and beginning a dialogue with them so that they may educate us as to their real needs for information. It would seem to be obvious that "decision support tools" are meant to do something very specific, that is support decision making. It's time that we begin to address this issue with the development and use of our quantitative computer-based instruments.

Footnotes

1 D.E. Harris, Representations Of A Harsh Reality: The Use Of Computer-Based Planning Models In Higher Education: (Ann Arbor, Mi.: University Publications, 1983).

2 J.R. Thelin, Higher Education And Its Useful Past: Applied History In Research And Planning: (Cambridge, Ma.: Schenkman Publications, 1982).

3 A.T. Masland, "Integrators And Decision Support System Success In Higher Education": (University Park, Pa.: Pennsylvania State University, 1983): 15-16.

4 R.F. Bacchetti, "Using Cost Analysis in Internal Management In Higher Education": NACUBO Professional File, 1977, 9 (1): 4.